

of a large portion of its exotic plants is due to them; and the improved systems of cultivation are in a great measure attributable to their efforts.

THE French Government has commissioned Count Horace de Choiseul, a member of the Chamber of Deputies, to proceed on a voyage of botanical research to Asia and the United States. He will visit the Botanical Gardens at Ceylon, Calcutta, Shanghai, Japan, San Francisco, &c., to collect botanical specimens not indigenous to France.

THE Royal Physical Society, of Edinburgh, seems to be doing much good work. At the second meeting for the present session, Sir William Turner in the chair, Mr. Hoyle read a note discussing the function of the Laurer-Stieda canal in the Trematoda; Mr. J. Arthur Thomson submitted an elaborate paper entitled "A Synthetic Survey of the Influence of the Environment upon the Organism"; the Secretary, Dr. Traquair, communicated a paper on an ornithological visit to the Ascrib Islands, by Mr. John Swinburne; and Mr. Brook gave some valuable notes on the marine Crustacea of the Clyde Estuary.

CAPT. WIGGINS, who successfully performed the sea voyage from Europe to Siberia last autumn in the steamer *Phoenix*, is shortly expected back in this country. He states that at the time of his leaving Yeniseisk, in Siberia, in October, the cold varied from 70° to 85° below zero, and that the mercury was frozen in the bulb.

AT the annual meeting and distribution of prizes at the School of Science and Art at Bromley, Kent, on Tuesday, Sir John Lubbock delivered an interesting address on technical education. He referred to a recent statement of Mr. S. Smith, one of the Commissioners on Technical Education, to the effect that it was not so much the longer hours and lower wages of Continental workmen, nor the tariffs, which were having such objectionable influence on our industries, but rather, in nearly all instances, the great attractiveness of the goods themselves, which had been made by workmen who had received special training in schools. Sir John Lubbock went on to say that if we had spent one tithe of the treasure which we sent abroad every year to buy the produce of the skill of other countries on the training of our own people, we should have been making these goods ourselves and shipping them to the East and West and to every country under the sun. We were constantly crying out for new markets, while there was a new market in every house in the country. We were apt, indeed, to forget how much we owed to science, because many things which were in reality scientific discoveries had become so familiar to us that we looked upon them almost as a matter of course. The electric light was still felt to be a triumph of science, but we forgot sometimes that the common candle was the result of a whole series of chemical discoveries. The Chinese were said to have examined candidates for the army until lately in the use of bows and arrows. We saw the absurdity of this; but we were not free from the same error ourselves.

IN a recent Consular Report there is a complete description of the Technical University of Belgium, which was founded in 1852, as well as a general sketch of the system of commercial and technical training prevailing in that country. Formerly the education in Belgian public schools (*Athénées*) was in the main classical, but in recent years a *section professionnelle* (commercial and scientific) has been added, and now takes its place as an integral portion of the public-school system. Here youths intended for commercial pursuits, from the fourth class upwards, receive special instruction, and then pass on to the *Institut*, or University, where the course lasts two years. The number of pupils is 150, a number which would be largely increased, but for the difficult entrance examination, the inability of many

parents to keep their children so long at school, and the prevailing idea that a youth intended for commerce cannot enter a counting-house too soon. The course at the *Institut* includes, besides languages, book-keeping, and the ordinary practical work of a merchant's office, a technical description of the ordinary articles of commerce, political economy and statistics, commercial and industrial geography, maritime and Customs' legislation, and the building and fitting out of ships. The fees range from £11 for the second year at the *Institut*, to £3 5s. per annum at the public schools. An extensive commercial museum, a chemical laboratory, and a commercial library are attached to the *Institut*. At the end of the course diplomas are given to the successful candidates, entitling them to the degree of *Licencié en Sciences Commerciales*. The rules, and a programme and syllabus of the lectures, are appended to the Report. The new language, *Volapük*, has been added as an experiment, mainly, it would appear, because of its possible utility for telegraphic communication.

THE additions to the Zoological Society's Gardens during the past week include a Mexican Deer (*Cariacus mexicanus* ♀) from the Island of Dominica, presented by Mr. George Anderson; a Water Rail (*Rallus aquaticus*), British, presented by Mr. G. J. Payne; two Black-headed Gulls (*Larus ridibundus*), British, presented by Mr. Thomas A. Cotton; two Common Peafowls (*Pavo cristatus* ♀♀) from India, presented by Mr. Richard Hunter; sixty-six Skylarks (*Alauda arvensis*), British, purchased; an Egyptian Vulture (*Neophron percnopterus*) from North Africa, received in exchange.

OUR ASTRONOMICAL COLUMN.

THE MAURITIUS OBSERVATORY.—The report of the Director of the Royal Alfred Observatory, Mauritius, for 1886, shows that the activity of the institution continues to be exhibited in two directions, viz. meteorological and magnetic observations, and the photographic record of the state of the solar surface. The meteorological observations have been extended during the year by the addition to the daily routine, of observations of the duration of bright sunshine, commenced October 1, of maximum and minimum dry and wet bulb thermometers in screens, begun November 1, and of an earth thermometer at 10 feet below the surface of the ground, begun the same day, the necessary instruments having been received from England. The year 1886 was a particularly dry one, the rainfall being below the average in every month, and the annual fall the smallest on record. No hurricane visited the colony; indeed, the last took place so long ago as March 21, 1879; but several cyclones occurred in the Indian Ocean, some of which passed near the island, and storm warnings were issued. Dr. Meldrum gives considerable importance in his report to the connection between the meteorology of the island and its health. It appears that wet years give specially high fever and death rates, the greatest mortality usually following the maximum rainfall by about two months. At the same time there has been a persistent increase in the death rate of late years, which appears to be independent of meteorological causes.

The photoheliograph was in constant operation, 533 photographs having been obtained on 353 days, but the sunspots were much fewer and smaller than in 1884 and 1885. Two photographs were also obtained of the solar eclipse of August 29, which commenced at Mauritius a little before sunset.

OCCULTATIONS OF STARS BY PLANETS.—The following list of possible occultations of stars by planets is in continuation of that given in NATURE, vol. xxxvii. p. 234:—

Planet.	G.M.T. of Con- junction in R.A.	Star.	Mag. Pl. - *.	Max. Dura- tion.
	h. m.			m.
♀ Jan. 25...	18 30' 0"	AOε, No. 17179	...8.5 - 0.39	5.0
♀ 31...	17 30' 5"	S.D. - 21° No. 4933	...9.3 + 0.58	4.7
♂ Feb. 5...	11 18	D.M. + 20° No. 2073	...9.5 - 0.88	108
♂ 16...	7 27	D.M. + 20° No. 2062	...9.5 + 0.38	121

OLBERS' COMET.—The following ephemeris for Berlin mid-night is in continuation of that given in NATURE, vol. xxxvii. p. 234:—

1888.	R.A.	Decl.	Log r .	Log Δ .	Bright- ness.
	h. m. s.	°			
Jan. 22...	17 18 29	3 49'6 S.	0.2866	0.3932	0.36
24...	17 21 39	4 5'3			
26...	17 24 44	4 20'4	0.2958	0.3948	0.34
28...	17 27 44	4 35'0			
30...	17 30 40	4 49'2	0.3048	0.3961	0.33
Feb. 1...	17 33 31	5 3'0			
3...	17 36 17	5 16'3	0.3137	0.3969	0.31
5...	17 38 59	5 29'2			
7...	17 41 36	5 41'7 S.	0.3224	0.3974	0.30

The brightness on 1887 August 27 is taken as unity.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 JANUARY 22-28.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on January 22

Sun rises, 7h. 55m.; souths, 12h. 11m. 46'3s.; sets, 16h. 28m.: right asc. on meridian, 20h. 16'9m.; decl. 19° 44' S. Sidereal Time at Sunset, oh. 34m.

Moon (Full on January 28, 23h.) rises, 11h. 58m.; souths, 19h. 8m.; sets, 2h. 29m.*: right asc. on meridian, 3h. 14'6m.; decl. 12° 39' N.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h. m.		h. m.		h. m.		h. m.	
Mercury...	8 16	...	12 24	...	16 32	...	20 29'3	21 11 S.
Venus....	5 7	...	9 15	...	13 23	...	17 19'6	21 7 S.
Mars.....	23 47*	...	5 19	...	10 51	...	13 22'8	6 13 S.
Jupiter...	3 35	...	7 53	...	12 11	...	15 57'2	19 33 S.
Saturn....	16 26*	...	0 19	...	8 12	...	8 22'5	19 56 N.
Uranus...	23 29*	...	5 1	...	10 33	...	13 4'6	6 9 S.
Neptune..	11 56	...	19 35	...	3 14*	...	3 41'8	17 54 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

Jan.	Star.	Mag.	Disap.	Reap.	Corresponding angles from ver- tex to right for inverted image.
			h. m.	h. m.	
23	... γ Tauri	...	4	...	19 near approach 51 —
26	... χ^3 Orionis	...	6	...	0 36 ... 1 20 ... 178 258
26	... 68 Orionis	...	6	...	4 57 near approach 215 —
28	... B.A.C. 2683	...	6	...	5 10 near approach 209 —

Jan.	h.	
22	... 1	Uranus stationary.
23	... 14	Saturn in opposition to the Sun.
24	... 23	Jupiter in conjunction with and 0° 8' south of β^1 Scorpii.
28	... 14	Saturn in conjunction with and 1° 10' north of the Moon.

Variable Stars.

Star.	R.A.	Decl.	
	h. m.		h. m.
U Cephei ...	0 52'4	81 16 N.	Jan. 25, 21 20 <i>m</i>
Algol ...	3 0'9	40 31 N.	" 23, 20 37 <i>m</i>
S Aurigæ ...	5 19'7	34 3 N.	" 28, <i>M</i>
R Canis Majoris...	7 14'5	16 12 S.	" 27, 20 36 <i>m</i>
			" 28, 23 52 <i>m</i>
S Cancri ...	8 37'6	19 26 N.	" 28, 22 28 <i>m</i>
W Virginis ...	13 20'3	2 48 S.	" 26, 5 0 <i>m</i>
R Camelopardalis.	14 26'1	84 20 N.	" 25, <i>M</i>
δ Libræ ...	14 55'0	8 4 S.	" 22, 19 51 <i>m</i>
			" 25, 3 42 <i>m</i>
U Ophiuchi...	17 10'9	1 20 N.	" 24, 3 4 <i>m</i>
		and at intervals of	20 8
δ Lyræ... ..	18 46'0	33 14 N.	Jan. 25, 23 0 <i>m</i>
V Cygni ...	20 37'7	47 45 N.	" 22, <i>M</i>
δ Delphini ...	20 37'9	16 41 N.	" 24, <i>M</i>
Y Cygni ...	20 47'6	34 14 N.	" 22, 20 40 <i>m</i>
			" 25, 20 33 <i>m</i>
δ Cephei ...	22 25'0	57 51 N.	" 28, 0 0 <i>m</i>

M signifies maximum; *m* minimum.

Meteor-Showers.

	R.A.	Decl.	
Near ι Ursæ Majoris ...	133	...	48 N.
" σ Leonis ...	167	...	5 N. ... Very swift.
" α Coronæ Borealis	236	...	25 N. ... January 28. Very swift.

GEOGRAPHICAL NOTES.

DR. MEYER has been giving an account of his ascent of Kilimanjaro to the Berlin Geographical Society, and from the brief abstract which has appeared his statements are not quite consistent with those made in his letter already referred to. For one thing, Alpinists are doubtful if Dr. Meyer got so close to the summit by a thousand feet as he himself thinks he did; and moreover, from his own statements, his aneroid was quite untrustworthy.

A SPECIAL meeting of the Paris Geographical Society was held on Saturday, to welcome MM. Bonvalot, Capus, and Pepin, who have been journeying in Central Asia. We have already on several occasions referred to this journey, during which the travellers crossed the Pamir, but not for the first time, as they themselves seem to believe. So far it would appear as if the original results of this expedition were of no great value.

THE paper at Monday's meeting of the Royal Geographical Society was by a young engineer, Mr. W. J. Steains, on an exploration of the Rio Dôce and its northern tributaries (Brazil). The Rio Dôce has been in past years a classical region for research in natural history, but for many years it has been neglected. It flows through a region that has scarcely been touched by the influences of civilization, a region which is the home of the Botocudos, one of the most primitive people on the face of the earth. The Rio Dôce lies between parallels 19°-21° S. latitude, and is formed by several small streams springing from the eastern slope of an important range of mountains known by the name of the Serra da Mantiqueira. This range, running in a north-easterly direction, forms a portion of the irregular "coast-range" of Brazil, and forms, so to speak, the "retaining wall" of the series of elevated, undulating tablelands composing the greater portion of Central and Southern Brazil. The total length of the Rio Dôce basin lying east of the Serra dos Aymôres is a densely wooded lowland, sloping gradually towards the coast from an elevation of about 900 feet. That portion of the Rio Dôce basin lying east of the Serra dos Aymôres is a densely wooded lowland, sloping gradually towards the coast from an elevation of about 900 feet. Near the coast this plain resolves itself into a long stretch of low alluvial ground, studded for the most part with small shallow lakes that communicate with each other by means of long, narrow, winding streams, called "vallôes." The largest of these lakes is the Lagôa Juparaná, which communicates with the Dôce some 30 miles above its mouth by means of a narrow, tortuous, deep channel 7 miles long. The lake is 18 miles long, and about 2½ miles broad at its southern extremity. It is very deep, and with the exception of some low alluvial ground at its northern and southern ends, is surrounded by high wooded bluffs, composed for the most part of reddish clay overlying a stratum of coarse red sandstone. At the head of the lake is a river—the S. José, which rises in the Serra dos Aymôres, and flows through an unexplored district, inhabited by wandering hordes of wild Botocudo Indians. Throughout the whole of its course, the S. José flows through dense forest abounding in the much sought-after "Jacarandá," or rosewood tree (*Bignonia carulea*, Will.). The Botocudos number about 7000 people, and among some of the more savage tribes cannibalism still prevails. Mr. Steains stayed several weeks among these people, and is therefore able to add something to our knowledge of them. In appearance Mr. Steains states, the Botocudos can scarcely be called prepossessing. The average height is 5 feet 4 inches. Their chests are very broad, and this accounts for the facility with which they can bend their bows, which are exceedingly strong, being made out of the tough springy wood of the Ayri or Brijaubá palm (*Astrocaryum Ayri*, Mart.). The feet and hands of the Botocudos are small rather than delicate, and these are in fair proportion to their legs and arms, which are lean but muscular. Concerning the colour of their skin, these Indians are of all shades, some being of a dark reddish-brown, whilst others, and especially the women, are quite light. With regard to features, the Botocudos struck Mr. Steains, as they have done